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Doc Type: Conference Paper

Title: Arc welding seam tracking system based on artificial neural networks

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Ind. CEC; Gesellschaft fur Informatik (GI); et al

Treatment: Practical

Abstract: A new approach towards controlling an arc welding seam tracking system based on process-oriented data is presented; an artificial neural network is the central controlling element. Special features of neural networks, such as trainability, abstraction capability and fault-tolerance give this controlling system significant advantages. The adaptation of the system to new welding tasks has been simplified substantially in comparison with conventional approaches: analysing the new process parameters and programming the system are replaced by producing reference data from the new welding process and subsequent automatic learning of an artificial neural network. Results on the basis of a quality function are presented. (13 Refs.)

Classification: C3355F (Control applications in assembling); C3120C (Spatial variables control); C7420 (Control engineering computing); C5290 (Neural computing techniques)

Thesaurus: Arc welding; Intelligent control; Learning systems; Neural nets; Position control; Tracking

Free Terms: Arc welding seam tracking system; Neural networks; Trainability; Abstraction capability; Fault-tolerance; Process parameters; Automatic learning; Quality function

Item Availability: CD-ROM.

INSPEC 4730738 B9409-8620-006 C9409-7420-046

Doc Type: Conference Paper
Title: Weld modeling and control using artificial neural networks
Authors: Cook, G.E.; Barnett, R.J.; Andersen, K.; Strauss, A.M.
Affiliation: Eng. Sch., Vanderbilt Univ., Nashville, TN, USA
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Conf. Sponsor: IEEE
Treatment: Application; Practical; Theoretical/Mathematical; Experimental
Abstract: Artificial neural networks were evaluated for monitoring and control of the variable polarity plasma arc welding (VPPAW) process. Three areas of welding application were investigated: weld process modeling, weld process control, and weld bead profile analysis for quality control. Experiments and analysis confirm that artificial neural networks are powerful tools for analysis, modeling, and control applications. They are particularly attractive in view of their capabilities to process nonlinear and noisy data, learn from actual welding data, and execute at relatively high speed. It is shown that neural networks are capable of modeling parameters of the VPPAW process to on the order of 10% accuracy or better. The same was observed when neural networks were used to select welding equipment parameters and the resulting bead geometries were estimated. These performance figures suggest that a VPPA welding control system can be implemented based on neural network models and control mechanisms. (12 Refs.)
Classification: B8620 (Power applications in manufacturing industries); B7210B (Automatic test and measurement systems); B0170L (Inspection and quality control); C7420 (Control engineering computing); C3355F (Control applications in assembling); C5290 (Neural computing techniques); C7410H (Computerised instrumentation)
Thesaurus: Arc welding; Computerised monitoring; Learning [artificial intelligence]; Neural nets; Process computer control; Quality control
Free Terms: Nonlinear data; Learning; Artificial neural networks; Monitoring; Variable polarity plasma arc welding; Process modeling; Process control; Weld bead profile analysis; Quality control; Applications; Noisy data; Accuracy; Performance
Item Availability: CD-ROM.

Search Options:

Search for both singular and plurals: YES

Search for spelling variants : NO

Display intermediate result sets : NO

Num	Search	Hits
#1	arc weld? and (robot? or manipulator?) and teach?	2